IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.: 10/730,800	§	
Filed: December 9, 2003	§	Examiner: Ngo, Chuong D.
Inventors:	§	Group/Art Unit: 2193
Debjit Das Sarma	§	Atty. Dkt. No: 5500-97400
	§	

Title: Apparatus And Method For Multiple Pass Extended Precision Floating Point Multiplication

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request. This request is being filed with a notice of appeal. The review is requested for the reason(s) stated below.

Applicant is not yet in receipt of an Advisory Action. Claims 1-22 remain pending in the application. Reconsideration of the present case is earnestly requested in light of the following remarks. For brevity, only the primary arguments directed to the independent claims are presented. Additional arguments (e.g., directed to the dependent claims) will be presented if the case proceeds to Appeal.

The Office Action rejected claims 1-22 under 35 U.S.C. § 101 on the grounds that the claimed invention is allegedly directed to non-statutory subject matter. Specifically, the Examiner asserts that the claims are directed to an apparatus and method "for merely performing manipulations and calculations of data values." Final Action at 3. The Examiner further asserts that "the claimed invention must recite a practical application," and cites *State Street* for the proposition that such a practical application must include transforming a physical object to a

different state or thing, or producing a useful, concrete, and tangible result. *Id.* The Examiner asserts that numerical values produced by the subject matter of the recited claims fail to constitute a useful, concrete, and tangible result, and further asserts that the claims are directed to a preemption of a method of manipulating data. *Id* at 4. The following clear errors in the Examiner's rejection are noted.

1. The claims recite particular physical elements that are <u>facially statutory</u>.

First, Applicant notes that <u>a circuit, as an apparatus, is in fact statutory subject matter, as is a system including such a circuit and a method of operation of the circuit</u>. Referring to the inquiry set forth in MPEP 2106.IV.C, it must then be determined whether the claim at issue recites a "judicial exception" – a law of nature, a natural phenomenon, or an abstract idea – or whether the claim recites a "practical application" of a judicial exception producing a "useful, concrete, and tangible result." Applicant notes that the claims recite <u>specific physical constructs such as partial product generation logic, carry save adders, carry propagate adders, and other types of circuitry configured in specifically recited ways</u>. That is, the claims do not recite <u>purely algorithmic</u> concepts in the abstract, but in fact recite <u>tangible circuit structure</u>. Applicant therefore submits that the "judicial exceptions" simply do not apply. Since the claims recite statutory physical circuit structures and their methods of operation, Applicant submits that the inquiry into whether the claims produce a "useful, concrete, and tangible result" is irrelevant, since this inquiry only applies when a "judicial exception" is in issue. MPEP 2106.IV.C.1.

2. The claims recite subject matter that produces a <u>useful, concrete, tangible</u> result.

The foregoing arguments notwithstanding, however, Applicant notes that the fact that the claims produce a useful, concrete, and tangible result <u>is in fact evident from the Examiner's remarks</u>. That is, the Examiner observes that the claims recite features configured to perform "calculations of data values." Applicant submits that <u>performing multiplication is itself an example of providing a useful, concrete, and tangible result</u>. More specifically, Applicant notes that claim 1 recites, *inter alia*:

"<u>partial product generation logic configured to generate a plurality of partial products</u>"

"a plurality of carry save adders . . . configured to accumulate said plurality of partial products generated during said first partial product execution phase into a redundant product"

"a first carry propagate adder . . . configured to reduce a first portion of said redundant product to a multiplicative product."

Applicant submits that one of ordinary skill in the art would readily recognize that the physical features of adders and other logic recited in claim 1 are arranged in specific ways so as to produce a number of concrete and tangible results having to do with the production of a multiplicative product. Moreover, these results are specifically recited within the claim: partial products, a redundant product, and a multiplicative product. Applicant further submits that the usefulness of processing such data is abundantly evident from the many examples of real-world circuits that implement computer arithmetic.

In response to the foregoing, the Examiner reasserts that "the claimed invention merely involves [] calculations and manipulations of data in performing computations" and that the results produced by the subject matter "are mere numbers without a practical application recited in the claims to give the result real world value, and thus is not useful, concrete and tangible." Final Action at 4. Applicant traverses the Examiner's remarks for at least the following reasons.

The MPEP describes the standards by which useful, concrete and tangible results are judged. MPEP 2106.IV.C.2. With respect to the usefulness of results, the claimed subject matter must provide a specific, substantial, and credible utility. *Id.* Applicant submits that as noted above, the utility of the results provided by the claimed subject matter is self-evident. The claims are directed towards the production of intermediate multiplication results from binary-encoded inputs according to specifically recited hardware, followed by the production of a final multiplicative product. Applicant notes that the multiplication of binary numbers is widely useful in numerous types of computational applications.

A tangible result, according to the MPEP, is "the opposite" of an abstract result. *Id.* Applicant notes that the claims do not deal with "mere numbers" in the abstract, as suggested by the Examiner. Rather, the claims deal in operations involving binary values that encode multiplicand and multiplier values. That is, the claims do not involve the manipulation of

abstract quantities, such as could be performed mentally. Rather, the recited elements of the claims operate on a <u>particular representation</u> of values. During operation, the recited elements, being circuit elements, produce <u>real-world</u> results in the form of electrical representations of encoded data indicative of intermediate and final stages of multiplication.

Finally, a concrete result is one that is repeatable or predictable. *Id.* Applicant submits that the multiplicative product produced by the subject matter recited in the claims is clearly repeatable on its face. There is nothing random or unpredictable in the course of producing such a product.

3. The claims fail to <u>preempt every substantial application</u> of an abstract idea.

Applicant further submits that the Examiner's comments regarding preemption are inapposite. Preemption applies where a claim comprises <u>every substantial practical application</u> of an abstract idea. MPEP 2106.IV.C.3. This section provides, as an example of preemption, "a computer that solely calculates a mathematical formula." *Id.* Applicant notes that the claims do not recite a mathematical formula in the abstract. Instead, as noted above, the claims recite <u>specific structure</u> configured to perform <u>specific operations</u> in the service of implementing multiplier functionality. Applicant notes that one of ordinary skill in the art would recognize a number of ways of performing the abstract function of multiplication that do not fall within the scope of the pending claims. For example, a circuit could iteratively add a multiplicand value to itself the number of times specified by the multiplier value to produce the multiplicative product. Since this embodiment of multiplication falls outside the scope of the claims, the claims cannot be said to preempt the abstract function of multiplication.

In response to the foregoing, the Examiner simply reasserts that "the claims appear to cover every substantial practical application" without addressing the merits of the argument given above. Final Action at 4. Applicant submits once again that in order to <u>preempt</u> the abstract idea of multiplication, the claims would have to encompass **<u>every conceivable apparatus</u>** that could be employed to produce a multiplicative product. However, **it is clear that alternative embodiments of multipliers exist that fall outside the scope of the claims**. Thus, the claims **<u>cannot</u>** be said to **<u>preempt</u>** the abstract idea of multiplication.

Similar arguments apply to the remaining independent claims and their dependent claims. For at least the foregoing reasons, Applicant submits that the pending claims recite statutory subject matter, and respectfully requests that the 35 U.S.C. § 101 rejection be withdrawn.

In light of the foregoing remarks, Applicants submit the application is in condition for allowance, and notice to that effect is respectfully requested. If any extension of time (under 37 C.F.R. § 1.136) is necessary to prevent the above referenced application from becoming abandoned, Applicants hereby petition for such an extension. If any fees are due, the Commissioner is authorized to charge said fees to Meyertons, Hood, Kivlin, Kowert & Goetzel PC Deposit Account No. 501505/5500-97400/AMP.

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Respectfully submitted,

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AGENT FOR APPLICANT(S)